In the radiation image sensor **4** in accordance with this embodiment, since the surface of substrate **10** is flattened by the flat resin film **12** made of a polyimide resin, the state of substrate surface would not influence characteristics of the scintillator panel **2** involved in the radiation image sensor **4**. Also, since the reflecting film **14** is disposed on the surface of flat resin film **12**, the optical output of the scintillator panel **2** involved in the radiation image sensor **4** can be enhanced.

Though a polyimide resin is used as the flat resin film **12** in the above-mentioned embodiment, it is not restrictive, whereby epoxy resin, Si resin, and the like may also be used. Also, though the thickness of flat resin film **12** is set to 10 μm in the above-mentioned embodiment, any thickness can freely be chosen without being restricted to 10 μm if appropriate as long as it is such a thickness as to eliminate the unevenness in the surface of substrate **10**.

Though an Al film is used as the reflecting film **14** in the above-mentioned embodiment, it is not restrictive; and Ag films, Au films, Pt films, and the like may also be used.

Though the SiO_2 film is used as the transparent inorganic film **20**, it is not restrictive; and inorganic films made from Al_2O_3, TiO_2, In_2O_3, SnO_2, MgO, MgF_2, LiF, CaF_2, AgCl, SiNO, SiN and the like may also be used.

Though CsI(Tl) is used as the scintillator **16** in the above-mentioned embodiment, it is not restrictive; and CsI(Na), NaI(Tl), LiI(Eu), KI(Tl), and the like may also be used.

Though a substrate made of Al is used as the substrate **10** in the above-mentioned embodiment, any substrate can be used as long as it has a favorable X-ray transmissivity, whereby substrates such as those made of C (graphite) mainly composed of carbon, those made of amorphous carbon, those made of Be, those made of SiC, and the like may also be used. Substrates made of glass may be used as well.

Though the SiO_2 film **20** is formed on the surface of first polyparaxylylene film **18** on the scintillator **16** side in the above-mentioned embodiment, the SiO_2 film **20** may be formed on not only the surface of first polyparaxylylene film **18** on the scintillator **16** side, but also on all surfaces of the first polyparaxylylene film **18**.

Though the second polyparaxylylene film **22** is formed on the surface of SiO_2 film **20** and the surface of first polyparaxylylene film **18** on the substrate **10** side, i.e., on all surfaces in the above-mentioned embodiment, the second polyparaxylylene film **22** acts to prevent the SiO_2 film **20** from peeling, whereby the material thereof is not restricted as long as the film is made of a transparent material, and it may also be formed in an area covering the SiO_2 film **20**.

As the polyparaxylylene film in the above-mentioned embodiment, not only polyparaxylylene but also polymonochloroparaxylylene, polydichloroparaxylylene, polytetrachloroparaxylylene, polyfluoroparaxylylene, polydimethylparaxylylene, polydiethylparaxylylene, and the like can be used.

According to the scintillator panel of the present invention, since the scintillator is provided on the flat resin film formed on the substrate, characteristics of the scintillator panel can be kept from changing due to the state of substrate surface. Also, the scintillator plate can enhance its optical output since it has a reflecting film. In the case where the scintillator is covered with an organic film, the scintillator can be protected against vapor (moisture).

According to the radiation image sensor of the present invention, since the scintillator is provided on the flat resin film formed on the substrate, characteristics of the scintillator panel constituting the radiation image sensor can be kept from changing due to the state of substrate surface. Also, the scintillator plate involved in the radiation image sensor can enhance its optical output since the reflecting film is provided. When the scintillator is covered with an organic film, the scintillator constituting the radiation image sensor can be protected against vapor (moisture).

In the method of making a scintillator panel in accordance with the present invention, the flat resin film is formed on the substrate, and the scintillator is formed on the flat resin film, whereby a scintillator panel whose characteristics would not change due to the state of substrate surface can be made. Also, since the reflecting film is formed on the flat resin film, the optical output of scintillator plate can be enhanced. When the scintillator is covered with an organic film, it is possible to make a scintillator panel which can protect the scintillator against vapor (moisture).

In the method of making a radiation image sensor in accordance with the present invention, the flat resin film is formed on the substrate, and the scintillator is formed on the flat resin film, whereby a radiation image sensor comprising a scintillator panel whose characteristics would not change due to the state of substrate surface can be made. Also, since the reflecting film is formed on the flat resin film, it is possible to make a radiation image sensor which can enhance the optical output of scintillator plate. When the scintillator is covered with an organic film, it is possible to make a radiation image sensor comprising a scintillator panel which can protect the scintillator against vapor (moisture).

From the invention thus described, it will be obvious that the invention may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended for inclusion within the scope of the following claims.

What is claimed is:

1. A scintillator panel comprising a radiation-transparent substrate, a flat resin film formed on said substrate, a reflecting film formed on said flat resin film, and a scintillator formed on said reflecting film.

2. A scintillator panel according to claim **1**, wherein at least a part of said scintillator is covered with a transparent organic film.

3. A scintillator panel according to claim **2**, wherein said transparent organic film covers over the all surfaces of said scintillator.

4. A scintillator panel according to claim **1**, wherein said flat resin film is directly formed on said substrate.

5. A scintillator panel according to claim **1**, wherein said scintillator is directly formed on said flat resin film.

6. A radiation image sensor comprising a radiation-transparent substrate, a flat resin film formed on said substrate, a reflecting film formed on said flat resin film, a scintillator formed on said reflecting film, and an imaging device disposed so as to face said scintillator.

7. A radiation image sensor according to claim **6**, wherein at least a part of said scintillator is covered with a transparent organic film.

8. A radiation image sensor according to claim **7**, wherein said transparent organic film covers over the all surfaces of said scintillator.

9. A radiation image sensor according to claim **6**, wherein said flat resin film is directly formed on said substrate.

10. A radiation image sensor according to claim **6**, wherein said scintillator is directly formed on said flat resin film.

11. A method of making a scintillator panel comprising steps of:

forming a flat resin film on a radiation-transparent substrate;

forming a reflecting film on said flat resin film; and

forming a scintillator on said reflecting film.

12. A method of making a scintillator panel according to claim 11, further comprising a step of covering at least a part of said scintillator with a transparent organic film.

13. A method of making a scintillator panel according to claim 12, wherein said transparent organic film covers the all surfaces of said scintillator.

14. A method of making a scintillator panel according to claim 11, wherein said flat resin film is directly formed on said radiation-transparent substrate.

15. A method of making a scintillator panel according to claim 11, wherein said scintillator is directly formed on said flat resin film.

16. A method of making a radiation image sensor comprising steps of:

forming a flat resin film on a radiation-transparent substrate;

forming a reflecting film on said flat resin film;

forming a scintillator on said reflecting film; and

disposing an imaging device opposite said scintillator.

17. A method of making a radiation image sensor according to claim 16, further comprising a step of covering at least a part of said scintillator with a transparent organic film.

18. A method of making a radiation image sensor according to claim 17, wherein said transparent organic film is covering the all surfaces of said scintillator.

19. A method of making a radiation image sensor according to claim 16, wherein said flat resin film is directly formed on said radiation-transparent substrate.

20. A method of making a radiation image sensor according to claim 16, wherein said scintillator is directly formed on said flat resin film.

21. A scintillator panel comprising a radiation-transparent substrate, a flat resin film formed on said substrate, a reflecting film formed on said flat resin film, and a scintillator formed on said reflecting film, wherein at least a part of said scintillator is covered with a transparent organic film, wherein said transparent organic film covers over all the surfaces of said scintillator, and wherein said transparent organic film reaches to the surfaces of said substrate.

22. A radiation image sensor comprising a radiation-transparent substrate, a flat resin film formed on said substrate, a reflecting film formed on said flat resin film, a scintillator formed on said reflecting film, and an imaging device disposed so as to face said scintillator, wherein at least a part of said scintillator is covered with a transparent organic film, wherein said transparent organic film covers over all the surfaces of said scintillator, and wherein said transparent organic film reaches to the surfaces of said substrate.

23. A method of making a scintillator panel comprising the steps of:

forming a flat resin film on a radiation-transparent substrate;

forming a reflecting film on said flat resin film;

forming a scintillator on said reflecting film; and

covering at least a part of said scintillator with a transparent organic film, such that said transparent organic film covers all the surfaces of said scintillator and reaches to the surfaces of said substrate.

24. A method of making a radiation image sensor comprising the steps of:

forming a flat resin film on a radiation-transparent substrate;

forming a reflecting film on said flat resin film;

forming a scintillator on said reflecting film;

disposing an imaging device opposite said scintillator; and

covering at least a part of said scintillator with a transparent organic film, such that said transparent organic film is covering all the surfaces of said scintillator and reaches to the surfaces of said substrate.

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